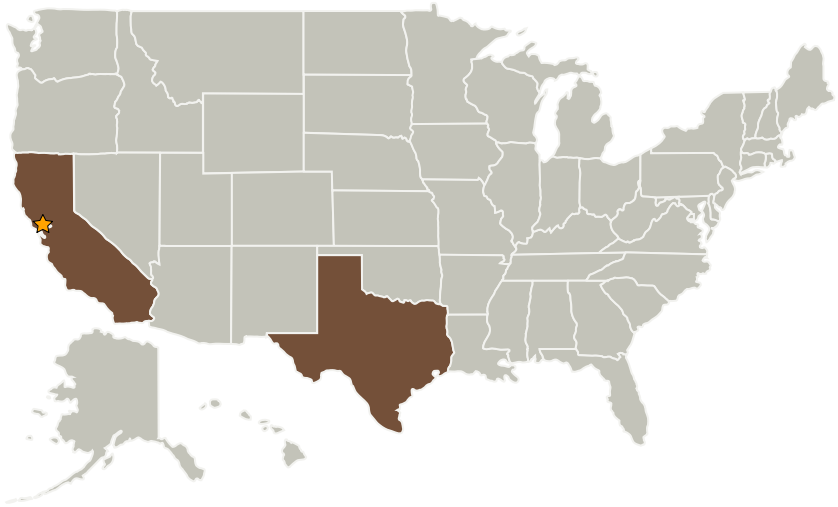
Novel Fabrication of Nano Device for Single DNA/Protein Detection, Phase I

Completed Technology Project (2004 - 2004)

Project Introduction

The health of the astronauts during space flight is critical to the success of NASA?s space program. Astronauts are exposed to tremendous environmental challenges, such as cosmic radiation, microgravity and confined space. Their immune systems are easily compromised. To study these effects, biomarkers such as nucleic acids and protein are measured to determine how the body reacts and adjusts to the stresses. Current detection methods rely on traditional molecular techniques that are time-consuming and require skillful operators. Also, the equipment needed is bulky and require high-power consumption. Therefore, many measurements are not conducted near real time but are completed after the samples are frozen and returned to earth. This leads to uncertainty on the reliability of the data. In order to overcome these problems, Lynntech proposes a novel method to fabrication a nano-electronic biochip that potentially can provide single DNA/protein detection in near real time. The proposed biochip will be more sensitive, smaller, more reliable, lower cost, and easier to operate for NASA?s mission than the most commonly used optical methods. The ultimate goal is to develop a small real-time nucleic acid and protein detection biochip capable of conducting measurements for long duration space missions.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Lynntech, Inc.	Supporting Organization	Industry	College Station, Texas

Primary U.S. Work Locations	
California	Texas

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Sze-shun Wong

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.3 Human Health and Performance
    - TX06.3.6 Long Duration Health